DESIGN CRITERIA

1. Related Sections: Division 01 and Sections 11 13 00, 23 90 00, 28 16 00, 28 23 00, and 28 31 76.
2. Reference Standards: Basic requirements for design are set forth in NFPA-101 Life Safety Code, NFPA-70 National Electrical Code, ANSI C2 National Electrical Safety Code, and in OSHA Regulations.
3. Electrical Systems: Electrical systems for large motors, compressors, and lighting for new commissaries: 277/480 volt, 3-phase. Receptacles, small motors, equipment loads and lighting not suitable for 277v: connect to 120/208V, 3-phase system.
4. One Line Electrical Diagram: Include detailed One Line Electrical diagram in the project drawings; not a Riser diagram. As a minimum, ensure the one line electrical diagram includes sizing information for the following:
   A. Panelboards/switchboards.
   B. Overcurrent protection.
   C. Feeders/conductors.
   D. Conduit.
   E. Transformers.
   F. Disconnects.
   G. Transfer switches.
   H. Generators.
   I. Type of transformer winding.
5. Wire Sizes: Show in American Wire Gauge (AWG). Show conduit sizes in inches.
6. Refrigeration System: Provide with separate electrical feeder. Refer to Section 23 90 00 and Design Plates 23 90 00-14/14A.
7. Project Refrigeration System Electrical Circuits: The Contractor and its display case manufacturer shall design and provide electrical circuits for the project refrigeration system (feeder from the load side of the manual transfer switch, refrigeration panelboards, case-to-case wiring for fans, lights, defrost control and power, Refrigeration Monitoring Control System, etc.). Electrical defrost for the product refrigeration system shall be rated for 208 Volt operation. Refer to Section 23 90 00 and Design Plate 23 90 00-14/14A.
8. Provide a manual transfer switch and generator connection box (example Berthold Electric #W12-5S-S28W9) mounted on the exterior of the commissary as a connection point for a Government furnished portable generator as an alternate source to the manual transfer switch. Location to be determined during design, considering availability of space for portable generator.
9. Electrical Metering: Provide as described in Section 26 51 00 Interior Lighting and 26 56 00 Exterior Lighting. Verify installation metering requirements and edit specification accordingly.
10. Electrical and communications distribution should be run overhead rather than under the floor for loads in the sales and checkout areas and in the processing rooms. Items impractical to feed overhead, such as wide island display cases that have no suitable place to attach overhead conduits, may be fed via the shortest underfloor conduit route available. Other exceptions may be approved by DeCA in special circumstances.
11. Electrical feeders and branch circuits in conduit should not exceed 9 current-carrying conductors in a conduit, except for conduit nipples 24 inches or less in length.
12. Security Alarm, Video Surveillance, and Fire Alarm/Mass Notification Systems design criteria are found in Division 28.

13. Electrical Wiring for Point of Sale and LAN Equipment: Special isolated-ground feeders, panels, circuits and wiring devices and standby engine-generator are required. These requirements are detailed in Section 26 05 26.

14. Commissary Operational Equipment Electrical Circuits: Provide electrical circuits for the commissary operational equipment, other than refrigeration electrical provided under Division 23, including balers, battery chargers for the material handling equipment (MHE) (walkie-stackers, pallet jacks, etc). Space battery chargers 48 inches apart horizontally to permit simultaneous recharging of MHE. Provide circuits for CFCI, GFCI, and GFGI equipment shown in the Equipment List or Equipment Descriptions for the individual project, and for any relocated or reused existing equipment.

15. Electrical Circuit Breaker Panels: Do not install electrical circuit breaker panels in any refrigerated storage or processing room due to requirements for wash-down cleaning. Do not attach panelboards to either side of any insulated cooler panel wall.

16. Interlocking Controls:

    A. Provide on all electrically operated dock levelers to prevent raising the dock leveler against a closed overhead door. Refer to Section 11 13 00.

17. Grounding Wire: Provide feeders and branch circuits with separate grounding wire sized in accordance with National Electric Code.

18. Rebates: Research power company rebate opportunities and incorporate design features when practicable that will avail DeCA of such monetary and financing incentives. Initiate rebate/incentive agreements with power company and host installation serving the project location and following through to assure a signed rebate agreement is made part of the final 100 percent design submittal or a waiver of rebate is signed by the DeCA Director of Facilities. The A-E shall include as a part of the construction specifications and bid schedule the requirement that the Contractor complete the power company request for payment in order that payment be made to DeCA or the host installation as applicable. Typical power company rebate opportunities are as follows:

    A. High Efficiency Lighting Systems.
    B. High Performance Building Envelopes.
    C. High Efficiency Packaged Air-Conditioners and Heat Pumps.
    D. High Efficiency Chillers.
    E. High Efficiency Motors.
    F. HVAC Controls.
    G. High Efficiency Water Heating.
    H. High Efficiency Refrigeration.
    I. Day Lighting Measures.
    J. Electric Cooking.
    K. Cogeneration.
    L. Power Conditioning.

19. Electric Motors: One horsepower and larger, polyphase induction motors: NEMA MG1 Premium Efficiency (current edition), energy-saver design type and power factor corrected to a nominal 95 percent, where possible. Locate capacitors near and switched with motor. Other motors not covered under MG1 Premium Efficiency standards shall be of the highest efficiency rating available for the application.

20. Corrosion Resistance: All exterior electrical equipment shall be corrosion resistant designs adequate for tropical marine, coastal, or wet atmospheres, as applicable to the project location.

21. Exposed Electrical: Paint electrical devices (raceways, boxes, etc.) exposed to view in the Sales Area of the Commissary. Install conduits and other devices in a neat and orderly fashion.

22. Construction Phasing: For renovation projects, analyze phasing requirements and provide adequate phasing notes in the construction documents to assure appropriate electrical support and timely incremental work completion during demolition and construction phases. Require timely coordination conferences between Contractor, Store Operator, Construction Inspector, Authorities Having

Jurisdiction, and Suppliers of critical equipment. Require timely investigation by the Contractor of the phase site before construction starts, to insure that critical clearances are correct (example: clearance above ceiling height for recessed light fixtures), and to determine and document existing conditions (example: existing inoperative or damaged electrical outlets, or items that will require temporary electrical service).

23. Design Analysis:

    A. Provide a Design Analysis that illustrates by narrative, calculations and cut sheets the basis of the electrical design. Provide calculations to support design decisions on sizes and ratings of electrical distribution elements; i.e., NEC load, ampacity, voltage drop, fault currents, arc flash levels, and illumination intensity. On Add/Alter projects, illustrate selective tripping coordination of new overcurrent protective devices with existing upstream protective devices and all load side protective devices, down to the branch panel feeder breaker level, using time/current graphs for the existing and proposed new breakers. On New Facility projects, include in the electrical narrative a discussion of protective devices selected to assure the possibility of selective tripping coordination. Provide in the Design Analysis or require the New Facility Construction Contractor to submit a complete coordination study including time/current graphs. Edit and use Guide Specification 26 28 01 for New Facility Projects, and for major Remodel projects, refrigeration replacement/ upgrade projects, and electrical replacement/upgrade projects that add or significantly change overcurrent protective devices above the small branch circuit level. For New Facility projects, provide or require the Construction Contractor to provide a complete arc flash study including location specific labels applied to gear. In major renovation projects, refrigeration replacement/upgrade projects, and electrical replacement upgrade projects, provide or require the Construction Contractor to submit an arc flash study including location specific labels applied to all replaced electrical gear and existing to remain distribution panels over 800 amps. All arc flash labels shall be of the location specific type, based on site specific calculations, indicating the voltage, PPE category, arc flash boundary, etc. Labels with only a generic message are not acceptable.

    B. Include in the design analysis a summary table of all product type selections based on Efficiency Recommendation Tables from DOE/FEMP's Buying Energy Efficient Products.

24. Design Plates: Edit any Design Plates incorporated in the project drawings to coordinate appropriately with individual project conditions. Do not include Design Plates that are not applicable to the project. Remove from these details any notes and instructions intended only for the designers.

25. Guide Specifications: Use DeCA guide specifications where available. Where DeCA guide specifications are not available for a needed item, use appropriate MasterSpecs or other commercial specs. Edit any guide specifications used to conform to individual project guidance and conditions, and to these design criteria. Edit each section used to remove any superfluous requirements; for example, delete seismic bracing, testing, and qualification requirements if the site zone does not require seismic considerations. Editing notes and suggestions are included in the Guide Specifications as "Hidden Text". Edit any text from these Design Criteria incorporated by the A-E into the design or construction specifications, to coordinate appropriately with individual project conditions and requirements and to remove instructions and notes intended only for designers. Do not include sections that are not applicable to the project in the Project Specifications.

END OF SECTION